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Experts Assess Carnegie Commission's Impact On U.S. Science Policy

While the panel's work has been influential, skeptics question the feasibility of some of its recommendations

BY BARBARA SPECTOR

The Carnegie Commission on Science, Technology, and Government, created in 1988 by the Carnegie Corporation of New York as a five-year-long effort to assess the way science is taken into account in the formulation of United States policy, ends its tenure June 30. The commission, its advisory council, and its 15 committees and task forces have included "the elite of the science

policy community in the country," in the words of Rep. George E. Brown, Jr. (D-Calif.)—among them three Nobelists (Rockefeller University geneticist Joshua Lederberg, University of Chicago physicist Leon M. Lederman, and Massachusetts Institute of Technology economist Robert M. Solow) and two former U.S. presidents (Jimmy Carter and Gerald R. Ford).

In assessing the success of the commission, outside observers as well as those associated with the group point to several of its recom-



A CAPITAL GROUP: Carnegie Commission executive director David Robinson, left, with former Rep. John Brademas of Indiana, one of the many Beltway insiders on the panel.

mendations that were implemented by the Bush and Clinton administrations and others that have earned a spot on the national agenda. At the final meeting of the full commission,

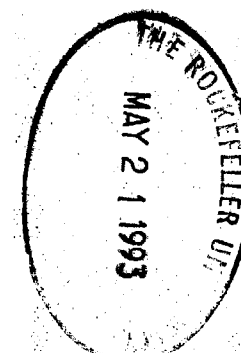
held on April 1 (Barbara Spector, *The Scientist*, April 5, 1993, page 3), Clinton's science adviser, John H. Gibbons, read a letter from Vice President Al Gore to the commissioners that stated: "The commission's highly productive efforts have already greatly influenced perspectives and actions across federal and state governments."

Members of the commission's target audience—including congressional representatives and other key policymakers—praise the panel for having "made a genuine contribution to the debate," according to John C. Crowley, director of the Massachusetts Institute of Technology's Washington, D.C., office. They laud the ability of the commission, which spent a total of about \$12 million to \$15 million, to produce "well-con-

ceived, well-written reports," as Crowley puts it.

Yet some observers, while praising the overall quality of the commission's work, question the relevance and feasibility of some of their recommendations. "In the net, I'd give them high marks," says Bruce L.R. Smith, a science policy analyst at the Washington, D.C.-based Brookings Institution. But, noting that one recommendation was for the appointment of a science counselor to the Secretary of State (in the commission's January 1992 report "Science and Technology in U.S. International Affairs"), Smith says, "They presume there are technological solutions to everything; they always want to have a scientific adviser

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Carnegie Commission: The Voices Of Experience

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to everyone and his uncle.

"You don't come up with simple answers to complex questions simply by mobilizing the scientists."

Focus On Process

The commission has deliberately focused its attentions on the processes of organization and decision-making in lieu of trying to find solutions to specific problems. Lederberg, a commission cochairman, says the rationale for the approach was that once a proper decision-making process was estab-



TRICKLE-DOWN EFFECT?
Commission staffer Maxine Rockoff says the recommendations could result in more opportunities for scientists, yet cochairman Joshua Lederberg says the commissioners do not see themselves as "lobbyists for the scientific community."

lished, "the right answers would come out of that process; we would not have to provide them."

Mark Schaefer, senior staff associate and director of the commission's Washington, D.C., office, says the approach fills a void. "Organization and decision-making are not given a lot of attention," he says. "People are more interested in the policy itself." But, he notes, commission members "who were very experienced in government" knew how unwise structures contributed to many daunting problems: "They could see organizational approaches

that work and don't work."

The commission's approach can be frustrating to some readers of the reports who are trying to formulate government policy, however. "I'm a goal-oriented person," says U.S. Rep. Rick Boucher (D-Va.), chairman of the subcommittee on science of the House Committee on Science, Space, and Technology. "I'd like to see more specific recommendations than I'm getting."

Ex-Politicians Join Up

On the other hand, commission member John Brademas, a former Democratic congressman from Indiana, says the panel's focus on process was one of the factors that induced him to join. "As a member of Congress, [I was] over and over again faced with the question of bringing knowledge together with policy," he says. "The idea of helping public policymakers consider and decide in as rational a way as possible had great appeal to me."

Former President Carter, for his part, says his work as chairman of the commission's Task Force on Development Organizations was a logical extension of his activities as founder of the Carter Center, an Atlanta-based nonprofit organization devoted to improving health, fighting hunger, resolving conflict, promoting democracy, and preserving human rights (see accompanying story).

"The more that I have become immersed in [the] Third World . . . since I left the White House, the more I see that we need some sort of comprehensive approach to, quote, foreign aid, unquote," he says. "The Carnegie project gave me an opportunity to concentrate on that. That's

why I felt it's worth the investment of my time."

Reports' Relevance

The commission did not set out to directly impact the lives of average working scientists, says Lederberg. "We didn't consider ourselves apologists or defenders or lobbyists for the scientific community," he says. "Our first responsibility was to the citizenry, not to the welfare of scientists." The ultimate goal, he says, was for "the average scientist [to] be part of a system that's functioning more efficiently, with better chan-



EXHIBITING PRESTIGE: Commission cochairman William Golden is chairman of the board of the American Museum of Natural History in New York.

neling of [scientific] knowledge into policy outcomes."

However, says Maxine L. Rockoff, senior administrator of the commission, if the reports' recommendations were implemented, there would be "more channels available for scientists to have their ideas and their knowledge brought to the decision-making process. To the extent that happens, there will be invitations and opportunities for scientists with relevant knowledge to affect the climate in which funding for research is done."

Specific commission recommendations could lead to job opportunities, says commission cochairman William T. Golden, chairman of the board of the American Museum of Natural History in New York. "If the attention paid within our federal and state governments to science and technology issues increases," he says, "there'd be some jobs available that do not now exist."

The Issues

Of the commission's roughly 400 recommendations, several have already earned serious consideration by top government officials and other policymakers (see story on page 9). Yet the commission's creator, Carnegie Corporation president David A. Hamburg, says he didn't originally intend for the panel to have immediate relevance. When he first hit upon the idea of a commission, he says, "I was primarily thinking long-term." But the commissioners began to address more near-term issues "partly for their own motivation; they felt they needed receptor sites, to

use a neuroscience analogy," he says. "I used to complain at meetings that they not lose sight of the long term."

Among the issues the commission did not address are two that are currently high on the national agenda: health care and U.S. research universities. Lederberg says the panel opted to stay away from health care because many other groups were studying the issue; thus, "access to expertise [was] not the limiting factor." On the matter of research universities, Lederberg said at the April 1 commission meeting, the group decided that because so many of the commissioners were academic scientists, a report on the subject—which of necessity would deal with research budgets—would appear self-interested. "We felt we should downplay that side in order to be more effective," he said.

A Limited Perspective?

Observers say the commission could have benefited from being more inclusive. "I'm suspicious of any organization that consists of almost exclusively over-50 white males," says Daryl Chubin, senior associate at the Office of Technology Assessment (OTA). There are three women on the 22-member commission and two on the 31-member advisory council.



SOCIETAL INFLUENCE: Rodney Nichols, CEO of the New York Academy of Sciences, is a member of the Carnegie Commission's advisory council.

Betsy Fader, executive director of Student Pugwash USA in Washington, D.C., a group of young men and women dedicated to exploring the interrelationship of science and society, says she has been especially concerned about the lack of young people on the commission. "So much of the commission's work involves moving away from past priorities and assessing future ones; [it should] include those who will be affected by the new priorities," she says.

"The people who are students now will be the managers of technology in 20 years' time. They're still undertaking the research; they really know what the challenges are."

Rodney W. Nichols, a member of the panel's advisory council and chief executive officer of the New York Academy of Sciences, ac-



**AN ACTIVITY FIT
FOR A PRESIDENT**

United Nations Commission on David Hamburg, who stresses that once President Jimmy Carter didn't merely lend his name to the commission — he rolled up his sleeves and got down to work from the very start. At an April 1990 Commission program Hamburg recalled for the audience a 1990 exploration meeting to discuss the formation of a task force on development organizations, which Carter would chair.

Spent the entire afternoon in his office, sat at his computer and wrote a draft of what he is understanding as the ongoing discussion and the implications of that discussion on the remainder of the day's work. And this is quite different from Carter's discussion, which was an inspiration to the rest of the commission, Hamburg said. He is now president of the United States, could go anywhere, but he is not going to leave his office.

Center, a nuclear engineering training center under his influence. The character of the first group changed from concentrating primarily on government agencies that could provide financial assistance to focus on the formation of partnerships between the United States and developing countries. This led to many fruitful partnerships and that old motto of "one committee member is worth ten to twenty men" has become reality. A more important reason that the National Science Foundation is successful is that it has been able to form partnerships with government, the private industry, and the community and academic institutions. One very notable within the community and academic institutions are the many research facilities, such as the Pittsburgh and the Brookhaven system.

The first session, December 1992, focused on *Strategies for Global Development and the Globalization Movement*, and the role of the National Action Research Institute for international development in foster cooperation among U.S. and international organizations and universities in the area of international development and in the area of training of the leaders in international development among developing countries.

traditional political opposition of the country has not been overcome. In 1997, the first semi-free elections alleviated the anger of the population of children of the armed conflict, who saw the return of a ruling elite who had committed crimes against humanity.

Developmental psychology, the study of human growth, is a subdiscipline of psychology that is concerned with the changes in human behavior that occur from birth to death. It is a field that is both broad and deep, and it is one that is constantly evolving. The study of human development is a complex task, and it is one that requires a deep understanding of the human mind and body. The field of developmental psychology is a rich and diverse one, and it is one that is constantly evolving. The study of human development is a complex task, and it is one that requires a deep understanding of the human mind and body. The field of developmental psychology is a rich and diverse one, and it is one that is constantly evolving.

knowledges that such criticism raises "quite a reasonable point." He notes that the commission's founders set out to recruit panelists who had the "highest possible credibility by dint of their professional standing and accomplishment. A younger group probably would have said something different."

Schaefer, who at 38 is one of the younger people associated with the commission, notes that while the commissioners generally tended to be 50 and older, "in developing our task forces, we did reach out to younger people." In addition to drawing on the expertise of commissioners, he explains, the panel recruited task force members and consultants of

might have made it more international."

Mission: Impossible?

The commission has been criticized for its repeated suggestions advocating a reorganization of government and nongovernmental agencies. *Science and Government Report (SGR)*, for example, opined in a review of the commission's September 1992 report "Enabling the Future: Linking Science and Technology to Societal Goals" (22[15]:8, Oct. 1, 1992): "Here, as in prior prescriptions, the Commission yearns to link existing organizations for further studies, convene meetings, and add to the capital's glut of unread reports."

Congressman Brown, who has "a high regard" for the work of the commission, acknowledges that the "changes in the structure of the federal govern-

ment" frequently advocated by the panel do not "seem too practical." He adds that "I've tried to achieve some of these same objectives without success."

Commissioners were aware of the trade-off involved with making less-than-practical recommendations, says Lederberg: "We had quite a debate about whether we would say what we thought would be the best thing or compromise in advance."

A question addressed by the task forces in their deliberations, says David Z. Robinson, the commission's executive director, was:

"If you make a recommendation that's impractical, does that hurt the rest of the report?" One detriment of including an infeasible recommendation, he notes, is that in analyzing the final product, "people say, 'That's that hopelessly naive report,' without realizing that there's a lot of good recommendations in the rest of the report." There's room for hope that recommendations currently viewed as dubious would be taken seriously if the political winds shift, he says: "You hope that you've planted a seed that will grow years later."

Achieving Consensus

Commission members and staff say the discussions of the various task forces sometimes became quite heated. "We had immense arguments," says Lewis M. Branscomb, chairman of the commission's Task Force on K-12 Mathematics and Science Education.

"We had a lot to settle. For example, can you discuss K-12 education without [also discussing] social problems?"

Branscomb, Albert Pratt Public Service Professor in the Science, Technology, and Public Policy Program at Harvard University's John F. Kennedy School of Government, says that "at the end," consensus was achieved by "getting the key protagonists in a room and locking the door." The goal of such encounters, he says, was "to figure out why the differences were occurring and to address the origins of those differences."

The chairperson of each task force, as well as the commission

staff, have played major roles in merging the divergent views into consensus report, working together to draft language that everyone can live with. "Obviously, one doesn't want to put together a lowest-common-denominator report, because that tends not to be strong," says Rockoff. "It takes time for a group to get to agreement," says Robinson. "It often takes toning down the language, but you want to get them signing on."

Boucher says the fact that Carnegie Commission reports are consensus documents can be a great help to a representative "inundated with reports," noting that, when he receives

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DEFENSE MECHANISM: Commission founder David Hamburg, left, with William Perry, who chaired a task force on national security and is now deputy secretary of defense.

varying ages. "It may appear on the surface that there were only older people, but, in fact, it was more mixed," he says.

In retrospect, says Hamburg, if he had the chance to do it over, "I would have included more young scientists and more bench scientists in the enterprise, and I would have involved more women and minorities. Also, I



AGREEING TO AGREE: Lewis Branscomb says that members of some task forces at times had difficulty reaching consensus in deliberations.

THE COMMISSION'S GREATEST HITS

Perhaps not coincidentally, the Carnegie Commission recommendations cited by commissioners as their favorites are those that have been implemented, wholly or in part, in United States policy. Commissioners acknowledge that "it would be foolish to say [that the policies in question were established] because we said so—there are too many intermediary steps," says Rodney W. Nichols, a member of the panel's advisory council and chief executive officer of the New York Academy of Sciences. Notes David Z. Robinson, the commission's executive director: "These ideas are in the air, but we speeded up the consideration."

The following accomplishments are frequently cited by commissioners:

- The recommendations that the president upgrade the position of presidential science adviser to an assistant to the president for science and technology and that the appointment be made early in the postelection period, as outlined in the commission's first report, "Science & Technology and the President," issued February 1989. George Bush, although slow to name D. Allan Bromley to the post, did elevate the position as recommended. That set the stage, at least, for a lot of optimism for the commission, says commission cochairman Joshua Lederberg, former president of Rockefeller University. Bill Clinton went further, appointing science adviser John H. Gibbon one month before he took office.

The notion that institutional linkages between the judicial and scientific communities be developed, as outlined in the commission report "Science and Technology in Judicial Decision Making," released March 31. Last summer, on the recommendation of the task force that produced the report, the Federal Ju-

dicial Center agreed to launch a pilot project on judicial management of scientific evidence, funded by the Carnegie Corporation. Nichols lauds the idea of a science unit in the judicial center for its "sheer novelty," calling the issue "a subject that has been touched not at all by the other think tanks." Even *Science and Government Report*, which has not hesitated to criticize the commission, called this recommendation "an indisputable bull's eye" (23[6]:3, April 1, 1993).

The recommendation that the Department of Education and the National Science Foundation create a mechanism for collaboration, as outlined in the September 1991 commission report "In the National Interest: The Federal Government in the Reform of K-12 Math and Science Education." A memorandum of understanding was drawn up last year between NSR and the Department of Education pledging to effect collaboration.

The recommendation that the Defense Advanced Research Projects Agency (DARPA) be transformed to reflect a national rather than solely military orientation made in the September 1993 commission report "Technology and Economic Performance: Organizing the Research and Development Strategy of National Technology Efforts." The commission's "one of many young and relatively small" members, following up on the recommendation, hopes to help in the creation of a new National Science Foundation Authorization Act proposal by the House of Representatives, turning the Science Department to drop the word "Defense" from DARPA's name, thus emphasizing its dual component of DARPA's mission.

—J.S.

Carnegie Panel Influenced Two Administrations

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a commission publication, "I know that report represents the opinion of the most esteemed scientific minds. They've performed a tremendous service."

Target Audience Responds

Specific commission recommendations have come into question by some members of the target audience for the panel's reports. OTA's Chubin, for example, says he's concerned about the suggestion in "Enabling the Future" that the National Academy of Sciences be the institu-

tion to administer a national forum on science and technology goals (Barton Reppert, *The Scientist*, Nov. 23, 1992, page 1). NAS is "a top-down, academically oriented institution," and thus perhaps not the best one to host such a forum, says Chubin. "If you put it in another kind of organization, you'd get a different kind of skew."

SGR (22[15]:8, Oct. 1, 1992) commented sardonically about the recommendation: "As homebase for this proposed superfluity [the forum], the Commission states its preference for the National

Academy of Sciences. . . SGR suggestion: Better yet, go for broke and put it in the U.S. Postal Service."

Boucher, on the other hand, says that "'Enabling the Future' has been quite helpful" to his subcommittee. "The Carnegie Commission correctly identified the problem—how to closely link the dollars that we spend to the goals we hope to achieve," he says. "It very nicely phrases the issue in a way the public can understand."

In one of its earli-

est efforts, an October 1991 report entitled "Science, Technology, and Congress: Analysis and Advice from the Congressional Support Agencies," the commission turned its attention to OTA, the General Accounting Office, the Congressional Research Service, the Library of Congress, and the Congressional

Budget Office. "I didn't think they captured what we're about," says OTA's Chubin.

The re-

port—which recommended "that OTA explore ways to enhance its interactions with other outside organizations"—"seemed to deny that there's informal contact" by staff of the agencies among each other as well as with nongovernmental organizations, Chubin says. "It read as if they're trying to justify a role for themselves. Implicitly, what they're saying is that we need [a nongovernmental organization] like the Carnegie Commission. I think a congressional support agency can do—and does—quite well what they say is needed."

Joining The Power Structure

The commission, which issued its first report as George Bush was settling into the White House, "tried very hard to be nonpartisan," says Lederberg. "We knew that this would be an ongoing thing, and we



PANELISTS: In photo above, from left, William Golden, John Brademas, Jimmy Carter, and Joshua Lederberg at a commission meeting. In photo at left, Lewis Branscomb, left, and John Brademas discuss an issue. In background is executive director David Robinson.

couldn't tie it to one administration. We wanted to do work that would make sense through a political transition, with nothing we need to alter."

The success of the panel at this endeavor can be measured by the extent to which members of the Carnegie Commission are now moving into the Clinton administration. Science adviser Gibbons, for example, was a member of several commission task forces. Commissioner William J. Perry, who chaired the commission's Ad Hoc Task Force on

National Security, is now deputy secretary of defense. Advisory council member Ashton B. Carter, also a member of that task force, has been nominated to be assistant secretary of defense, and commissioner Sheila E. Widnall has been nominated to be the Air Force secretary. At press time, Carter and Widnall had not been confirmed.

Quipped Perry at the April 1 meeting: "I'm in the awkward position of having spent several years advising myself what I should be doing." □